

INTEGRATED WEED MANAGEMENT PLAN

Battleground Lake State Park

2002-2005

I. INTRODUCTION

Noxious weeds threaten Washington's irreplaceable resources. These non-native, invasive species threaten our parks, wildlife, property values, public health and safety, waterways, rangelands, and general ecological health and diversity of our native ecosystems. While the economic effects of noxious weeds on agriculture are enormous, their effects on the natural resources and ecological diversity of the state compound those losses. Non-native species are the second leading cause of losses in biological diversity (Vitousek et al. 1996; Randall 1996). These resources, once destroyed, are irreplaceable.

In recognition of the negative impacts of noxious weeds, Washington State has a long history of noxious weed law. Chapter 17.10 RCW, the current weed control statute, requires private and public landowners to control noxious weeds on their property. Washington's noxious weed list is adopted annually and is found in WAC 16-750. Some species are mandated for control at the state level, while others are mandated for control by individual counties. This plan provides a framework to control those plant species listed as "noxious" in Clark County.

PROPERTY DESCRIPTION

Battle Ground Lake State Park is located 19 miles northeast of Vancouver, and three miles east and north of the community of BattleGround in Clark County. The park consists of 279.5 acres of land and 4,100 feet of freshwater shoreline surrounding a 28 acre lake. It is popular belief that a maar volcano may have formed the lake. Hot magma or lava pushing to the surface of the earth met with ground water to create a large steam explosion, which created the crater the lake sits in.

A park management plan for Battle Ground Lake State Park is expected to be completed in the upcoming year. This plan will detail future park management issues, including protection of plant and animal communities, riparian zones and wetland environments. Noxious weeds are a threat to resources and restoration efforts.

Two groups of the threatened species *Cimicifuga elata* or tall bugbane were found in the park. Group one can be found in an island of vegetation between paved trails near the bathhouse, and group two is found near a lakeside trail south of the boat launch.

II. OVERVIEW OF INTEGRATED WEED MANAGEMENT PLAN

A. General Management Philosophy

Weed control is part of property management. This plan is based on the desired plant species and communities, rather than on simply eliminating weeds. Preventive programs will be implemented to keep the park free of species that are not yet established there but which are known to be pests elsewhere in the area. Priorities are set to reduce or eradicate weeds that have already established on the property, according to their actual

and potential impacts on the land management goals for the property, and according to the ability to control them now versus later. Actions will be taken only when careful consideration indicates leaving the weed unchecked would result in more damage than controlling it with best available methods.

The plan follows the adaptive management approach. First, weed species are identified through inventory of the property and by gathering information from other sources. Second, land management goals and weed management objectives are established and recorded for the property. Third, priorities are assigned to the weed species and weed patches based on legal requirements, distribution, severity of their impacts, and ability to control them. Fourth, methods are considered for controlling them or otherwise diminishing their impacts. Fifth, Integrated Weed Management (IWM) plans are developed based on this information. Sixth, the IWM plans are implemented. Seventh, the results of the management actions are monitored and evaluated in light of weed management objectives for the park. Finally, this information is used to modify and improve weed management objectives, control priorities, and IWM plans, thereby starting the cycle again. The premise behind this weed management plan is that a structured, logical approach to weed management, based on the best available information, is cheaper and more effective than an ad-hoc approach where one deals with weed problems as they arise.

B. Inventory of Weed Species

Several state-listed noxious weeds are known to occur at Battle Ground Lake State Park (Table 1). Additional surveys are needed to more thoroughly assess the presence of noxious weeds at Battle Ground Lake.

C. Priorities for Weed Management

Priorities are set with the goals of complying with state law, protecting resources, and minimizing the total, long-term workload. Therefore, highest priority is given to preventing new infestations and controlling existing infestations that are the most limited in size, fastest growing, most disruptive, and most likely to affect the most highly valued area(s) of the park. Additional considerations include difficulty of control, giving higher priority to infestations that are most controllable with available technology and resources.

The most important weed management action is to prevent weeds from becoming established. Prevention activities can take several forms. Identifying and minimizing pathways for new weed introductions is critical. For example, the use of certified seed can minimize the risk of introducing weeds during a restoration project. A regular survey to identify new infestations before they have a chance to spread is also crucial. As part of this plan, park staff and volunteers will be trained to identify noxious weeds that are likely to occur at the park. In addition, efforts will be made to establish desirable, native vegetation whenever possible. In the absence of bare ground and disturbance, undesirable weeds are less likely to establish.

In this plan, several criteria were used to set weed management priorities.

- ◆ *State requirements.* Species that are Class A or Class B-designates, or are county-selected for control are given the highest priority. At Battle Ground Lake, meadow knapweed is the only known species that is state-mandated for control in Clark County.
- ◆ *Distribution.* Higher priority is given to species that have very limited distribution in the park. In these instances, there is an opportunity to eradicate a species before it becomes a widespread problem.
- ◆ *Potential impact to priority resources.* The classification and management plan for Beacon Rock identified several priority species and habitats. Priority is given to managing noxious weeds that directly threaten these resources.
- ◆ *Likelihood of control with existing technology and resources.* Higher priority is given to species that can realistically be controlled with existing techniques, funding, and staff levels.

The following pages include specific control plans for priority weed species: Brazilian elodea, and meadow knapweed. Control of the other noxious weeds at the park is not considered a priority at this time; there is no legal mandate for control, and the impact on park resources is considered limited.

Specific Control Plans For Priority Weed Species

Scientific Name: Egeria densa Planch ***Common Name: Brazilian elodea***

A. Priority

Medium. This species is a class B weed. Brazilian elodea is well established in the litoral zones of Battle Ground Lake. It has the potential to infest the lake on a greater scale therefore greatly affecting the native inhabitants of the aquatic and riparian communities. This plant also threatens public safety and recreation abilities.

B. Description

Brazilian elodea bears small leaves in a whorled arrangement, which are approximately one to three mm long and up to 5 mm wide. Short internodes give the plant a very dense appearance. The stems are erect and cylindrical simple or branched. This plant will often grow until it reaches the surface of the water, at which time it tends to form dense mats. There are typically two growth flushes of the plant, one occurring in the spring and the other in the fall. Each period of growth flush is followed by a short period of senescence. During the summer it may form a dense canopy, creating tangled mats at the water's surface. Brazilian elodea can easily reproduce from plant fragments or root crown parts.

C. Current Distribution On The Site

See map. Brazilian elodea is found in the litoral zones around Battle Ground Lake

D. Damage and Threats

Brazilian elodea competes for natural resources in native communities. This competition can result in reduced aquatic vegetation that provides food and habitat for fish and other aquatic species. The non-native species can also shade the water column resulting in reduced algae growth. Dense growth can cause dangerous conditions for swimmers and boaters. Waterways may become inaccessible.

E. Goals

The goal is to control the spread of this species in Battle Ground Lake. In addition, this lake was used as a test subject by the Department of Ecology for a study involving the herbicide Diquat.

F. Objectives (Measurable)

(1) During 2002-2003 work with the Department to Ecology to define most appropriate and effective control methods.

G. Management Options

Mechanical control is not typically an effective means of control due to *Egeria's* ability reproduce from fragments. In cases of very small invasions localized control with opaque fabric may be effective. Research shows positive results with the use of diquat, an aquatic herbicide, and although it has been used extensively in other states it has not yet been widely used in Washington. The existing conditions at Battle Ground Lake make it an ideal test lake for diquat use.

H. Actions Planned (treatments and monitoring)

Vegetation Survey

Diquat application

Water Quality Monitoring

Vegetation Survey

Hand Pulling

Grass Carp Stock

I. Cost Estimates

Grass carp are \$12 per 8-10 inch fish

J. Evaluation

During the summer of 2003 an aquatic herbicide called Diquat was applied to the lake. This herbicide application was part a research study. The study included dive surveys of aquatic plants and water quality monitoring sponsored by the Department of Ecology study. A dive survey after the herbicide application in the month of May determined that the herbicide was more successful than expected. At that time it was recommended that remaining plants should be hand pulled by divers. An additional dive was scheduled for July 30th to hand-pull the remaining plants. Divers hand pulled some of the plants, but upon further survey they determined that there were too many plants to be efficiently controlled with hand pull methods.